

12: Moons, Rings, and Kuiper Belt Objects

Learning Objectives

- Study the properties of the Galilean Moons, the larger moons of Saturn and Neptune.
- Study the properties of the medium-sized moons.
- Explain why so many Jovian moons are geologically active.
- Describe the properties, composition, and nature of the rings of the Jovian planets.
- Describe Pluto and the other Kuiper Belt objects and explain why Pluto was demoted from planet to dwarf planet.

The outer solar system has over 200 moons orbiting the four Jovian planets. These moons contain more ices than the moons of Earth and Mars. Many of them are more like comets in composition than asteroids. They range in size from the larger Galilean moons of Jupiter to numerous small, irregular bodies.

We can divide the outer moons into three size categories. Small moons are those less than 300 km in diameter. These are by far the most numerous moons. They do not have enough mass for their gravity to shape them into a sphere. Most of them are irregular or “potato” shaped. Many of them are likely captured asteroids or comets. As a result, their orbits do not follow the usual patterns in terms of direction and distance from the planet.

Medium-sized moons are between 300 and 1500 km in diameter. They are large enough to be spherical and have substantial amounts of ice. Unlike the smaller moons, they formed in orbit around the Jovian planets and have circular orbits in the same direction as the planet’s rotation. Medium moons many have had geological activity in the past but have lost the internal heat of their formation. Because of this, they are no longer geologically active.

The large moons are those greater than 1500 km in diameter. Like the medium moons, they are spherical, formed in orbit around the Jovian planets, and orbit in the same direction as their planet’s rotation. Due to tidal stresses, the large moons are still geologically active.

Image credit: <https://www.flickr.com/photos/kevinmgill/49724716636>;

12: Moons, Rings, and Kuiper Belt Objects is shared under a [CC BY-NC-SA](#) license and was authored, remixed, and/or curated by LibreTexts.